Winston H. Hickox
*Secretary for Environmental Protection*

# Department of Pesticide Regulation

James W. Wells, Director
830 K Street • Sacramento, California 95814-3510 • www.cdpr.ca.gov

Gray Davis
*Governor*

M E M O R A N D U M

To: Kathy Wynn, Registration Specialist HSM-99009
Pesticide Registration Branch

FROM: Tom Thongsinthusak, Staff Toxicologist **[original signed by T. Thongsinthusak]**
Worker Health and Safety Branch
(916) 445-4267

DATE: August 10, 1999

SUBJECT: BRAND NAME: Propargite
ACTIVE INGREDIENT: Propargite
COMPANY NAME: Uniroyal Chemical Company, Inc.
I.D. NUMBER: 170095
RECORD NUMBER (RN): 159126
DOCUMENT PACKAGE NUMBER (DPN): 259-186
EPA REGISTRATION NUMBER: 400-0-
TITLE: EVALUATION OF THE PROTECTIVENESS OF KLEENGUARD® LP AND TYVEK® SARANEX® 23-P DURING MIXING/LOADING AND AIRBLAST APPLICATION OF DORMANT OIL/ORGANO-PHOSPHATE INSECTICIDES IN TREEFRUITS

I reviewed the above document (DPN 259-186, RN 159126) regarding a study of protectiveness of Kleenguard® LP and Tyvek® Saranex® 23-P. This study was also published in a scientific journal (Krieger *et al.*, 1998). The submitted report compared field exposure data for workers who wore Kleenguard® LP or Tyvek® Saranex® 23-P during mixing/loading and airblast applications of dormant oil/organophosphate insecticides in treefruits.

The Department of Pesticide Regulation (DPR) has adopted Tyvek® coveralls laminated with Saranex® (white or gray) as chemical resistant personal protective equipment (PPE) because the fabrics meet the stringent chemical resistant requirements of the California Code of Regulations (CCR) (Krieger and Okumura, 1989). “Chemical resistant” means a material that allows no measurable movement of the pesticide being used through it during use (CCR, 1997; U.S. EPA, 1993).

The study was conducted in Fresno, California, where two independent work crews were employed. There were two workers and one foreman in each work crew. These workers applied four organophosphorus (OP) insecticides (methidathion, chlorpyrifos, naled, and diazinon) and two pyrethroids (esfenvalerate and permethrin) according to growers’ application schedules. Crew members wore either Kleenguard® LP or Tyvek® Saranex® 23-P. Urine samples were collected and analyzed for alkylphosphate metabolites. OP equivalents were determined from

anticipated metabolites. The submitted report indicated that Kleenguard® LP provided superior comfort and equivalent protectiveness against pesticide exposure.

I noticed the following factors that could influence dermal exposure of the crew members to those OPs. These factors arose from the study design and the influence of weather conditions during handling of OPs. These factors might confound the comparison of the protectiveness of Kleenguard® LP and Tyvek® Saranex® 23-P.

1. The report revealed that most urine samples contained alkylphosphate metabolite(s) less than the limit of quantitation (LOQ) of 25 μg/L. Only a few samples were detected for metabolites. Determination of total excreted metabolite(s) were based on detected metabolite(s) + 1/2 LOQ of the anticipated metabolite(s). It may be inappropriate to compare the protectiveness of the two PPE when most urine samples contained metabolites in unquantifiable concentrations.

2. Sometimes the crew members augmented their work clothes (e.g., long pants, long-sleeved shirts, socks, and shoes) by wearing baseball caps, coats, sweatshirts, or coveralls. There was no information whether all crew members uniformly wore augmented work clothes and PPE. In the morning and on particularly cold days, a windbreaker or jacket would sometimes be worn over the protective clothing. The extra clothing protection hindered the penetration of pesticides through either Kleenguard® LP or Tyvek® Saranex® 23-P.

**Conclusion:**

It appears that results from this field study could not be used to support unequivocally that Kleenguard LP garments are equivalent under field conditions to Tyvex® Saranex® 23-P as mentioned in an agreement about Kleenguard® LP (Donahue, 1995). Furthermore, Gibbons (1995) reviewed results of a laboratory test for Kleenguard® LP and concluded that this type of fabric does not fit in the chemical resistant protective clothing category.

**Recommendations:**

In order to avoid any undesirable health effects during handling of a pesticide, a more definitive field study of the protectiveness of Kleenguard® fabrics is needed. We would also like the study sponsor to consider Kleenguard Ultra instead of Kleenguard® LP. Based upon Kimberly-Clark's testing procedure to demonstrate a fabric's resistance to greases and oils, WD-40 readily penetrated Kleenguard® LP, but not Kleenguard® Ultra. The results indicated that the EC formulation of pesticides might readily penetrate PPE made of Kleenguard® LP material.

The study sponsor/director may contact the Worker Health and Safety Branch concerning the design of a field study to evaluate the protectiveness of Kleenguard® LP or other PPE during mixing/loading and airblast application of propargite products.

References:

CCR. 1997. California Code of Regulations, Food and Agriculture, Division 6. Pesticides and Pest Control Operations, Section 6000. Definitions.

Donahue, J. 1995. Meeting and agreement about Kleenguard® LP. A memorandum dated April 10, 1995, to Ron Oshima. Worker Health and Safety Branch, DPR.

Gibbons, D. B. 1995. Barrier effectiveness of Kleenguard® LP fabric versus impervious laminated fabrics to Omite® 30W and Omite® 6E pesticides. A memorandum dated April 19 to Kathy Wynn. WH&S, DPR.

Krieger, R. I., and Okumura, D. 1989. Clarification of protective clothes for body protection. WHS 89-6. A letter addressed to County Agricultural Commissioners dated March 2. Department of Food and Agriculture.

Krieger, R. I., Dinoff, T. M., Korpalski, S., and Peterson, J. 1998. Protectiveness of Kleenguard® LP and Tyvek® Saranek® 23-P during mixing/loading and airblast application in treefruits. *Bull. Environ. Contam. Toxicol.* 61: 455-461.

U.S. EPA. 1993. *The Worker Protection Standard for Agricultural Agricultural Pesticides-How to Comply*. United State Environmental Protection Agency, Prevention, Pesticides, and Toxic Substances. July.

cc: Chuck Andrews
John Ross
Dennis Gibbons

(TCW/Memos/HSM-99009)